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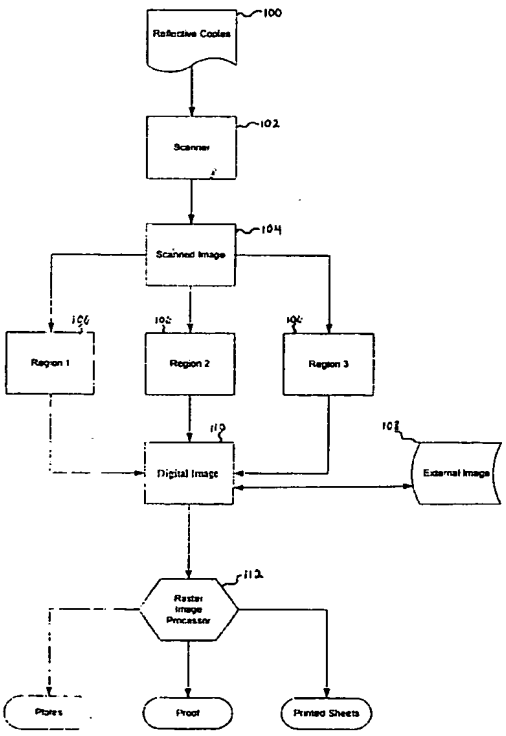
[Continued on next page]

(54) Title: OPTICAL TO DIGITAL PREPRESS WORKFLOW SYSTEM AND METHOD

Process Flow Diagram



(57) Abstract: A scanner provides various tools for processing and manipulating a digital image of a document. Regions of the image can be processed and manipulated separately. The scanner is connected, for example, by a network, to send the image to an output engine. The output engine can include a digital plate master or a digital press, which can be used for large print jobs.

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OPTICAL TO DIGITAL PREPRESS WORKFLOW SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/324,171 filed on September 21, 2001.

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FIELD OF INVENTION

[0003] The present invention relates to optical to digital workflow systems and methods for integrating hard copy originals into a digital workflow.

BACKGROUND OF THE INVENTION

[0004] Many print shops are transitioning from an optical to a digital workflow with computer to plate or computer to press systems. However, hard copy originals continue to be a significant portion of print shops business, and the print shops are challenged to integrate hard copy originals into their digital workflow. Although the layout of the hard copy original may be close to what is desired on the final output with some relatively minor alterations, to recreate the

document electronically would require significant time, resources, and increase the cost of reproducing the document. Therefore, print shops trying to move into the digital world are required to maintain both optical and digital systems, because the traditional methods of recreating hard copy involve using an optical camera or platemaker.

[0005] The process for recreating hard copy is time consuming. If the original contained a photographic image, the image would be placed on the camera and screened into a halftone. This image is then pasted into position along with type. If corrections or changes need to be made, someone must typeset the copy and paste it into the layout. For jobs containing spot color, separations must be generated by hand. Some printed spot colors do not copy accurately and those portions of the job may need to be reproduced so that the camera or platemaker can pick up the information. Depending on the complexity of the job it could take 15 minutes to several hours to recreate the hard copy.

[0006] The quickest way to recreate the hard copy into a digital format is to use a digital scanner. The hard copy is placed on the scanner and the document is capture into a digital file. However, new problems arise from this method. To use the scanner, a skilled operator is required who knows how to operate the device and all the desktop applications correctly. The document, once scanned, becomes an image and is no longer in a format that is easy to edit. Since the document is now an image, the quality of type and artwork will suffer on output.

[0007] To rebuild the hard copy into a digital file also requires an excessive amount of time and a skilled desktop operator. The original document needs to be measured for spacing and font size, and type needs to be set. If the exact fonts used in the original document are not available, a substitute font must be used. Continuous tone images need to be scanned and

manipulated. If the original image is not available, then a poor quality laser print copy may need to be used. Any complicated artwork such as company logos need to be remade as a digital file. If the hard copy is a printed process color job and the original continuous tone image is not available, it may be impossible to recreated the color image.

SUMMARY OF THE INVENTION

[0008] The invention provides an optical to digital prepress workflow method comprising the steps of converting an optical image into a digital version of the image; displaying the digital version; selecting a region of the digital version; designating a region type for the region; translating the region into coordinates; separating the region from the digital version and processing the separated region into a separate region image; manipulating the separate region image; and assembling the region image into an output image. Further steps include selecting a second region of the digital version; designating a region type for the second region; translating the second region into coordinates; separating the second region from the digital version and processing the separated second region into a separate second region image; manipulating the separate second region image; and assembling the second region image into the output image. The invention also provides an optical to digital prepress workflow system comprising a scanner and processor adapted for scanning an optical image and converting the image to a digital version of the image. A display is provided for displaying the digital version of the image. An operator control is used for selecting a region of the digital version, wherein the processor translates the region into coordinates, separates the region from the digital version, and processes the separated region into a separate region image. The operator control and processor are adapted for

manipulating the separate region image and assembling the separate region image into an output image. A connection is provided for connecting the processor to an output engine.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a block diagram showing a system incorporating an embodiment of the present invention;

[0010] FIG. 2 is a process flow chart showing an embodiment of the system;

[0011] FIG. 3 is an exemplary embodiment of a job setting screen interface;

[0012] FIG. 4 is an exemplary embodiment of a page screen interface;

[0013] FIG. 5 is an exemplary embodiment of a scanned page view interface;

[0014] FIG. 6 is an exemplary embodiment of region selection;

[0015] FIG. 7 is an exemplary embodiment of a color tab screen interface.

[0016] FIG. 8 is an exemplary embodiment of the color library screen interface;

[0017] FIG. 9 is an exemplary embodiment of a scan threshold tab screen interface

[0018] FIG. 10 is an exemplary embodiment of a borders tab screen interface;

[0019] FIG. 11 is an exemplary embodiment of a background tab screen interface;

[0020] FIG. 12 is an exemplary embodiment of a photo adjust tab screen interface;

[0021] FIG. 13 is an exemplary embodiment of a reverse image tab interface;

[0022] FIG. 14 is an exemplary embodiment of a scan to disk screen interface;

[0023] FIG. 15 is an exemplary embodiment of a scan to disk scanned page view screen interface;

[0024] FIG. 16 is an exemplary embodiment of a page template layout;

[0025] FIG. 17 is an exemplary embodiment of an ink bar selection on the bottom layout;

[0026] FIG. 18 is an exemplary embodiment of an ink bar selection on the side layout;

[0027] FIG. 19 is an exemplary embodiment of a cut marks on a page;

[0028] FIG. 20 is an exemplary embodiment of a template management screen interface;

[0029] FIG. 21 is an exemplary embodiment of a template management page size screen interface; and

[0030] FIG. 22 is an exemplary embodiment of a system utilities screen interface.

DETAILED DESCRIPTION OF THE INVENTION

[0031] Referring now to the drawings, FIG. 1 shows a block diagram of a optical to digital prepress workflow system (ODW) 10 in accordance with one embodiment of the present invention. The ODW includes a server 12 connected to a centralized storage device or database 14, at least one user device 16, a scanner 18 to digitize the reflective copy or hard copy originals 20, and an output device 22. The server 12 is a software module that controls the scanner 18, database 14, and user device 16. The database 14 may be stored on the user device 16 or can be stored remotely from the user device 16. The user device 16 may be a computer terminal or hand-held device, which may access the server 12 via a network 24, such as an internet, an intranet or other private network. The user devices may also include any device capable of interconnecting to the network 24 including a web-based hand-held device or other connectable equipment. The output includes a raster image processor connected to an output engine, such as a digital plate master or digital press as discussed below.

[0032] FIG. 2 is a process flow diagram 90 that illustrates how a user can control the scanner, image manipulation, and image placement within the same system, and the output is optimized for the selected output device. The user places a reflective copy 100 onto a scanner 102, the scanner 102 digitizes the copy 100 into a scanned image 104, the user selects and describes each region 106 of interest, and the system translates each region 106 into coordinates on the digital image and processes each region into a separate region image. The system performs a single scan for all image types of the image, for example, text, line art, screens, even if several image types are present in the same image job. This allows the system to preserve the original page layout with options to add or delete region images. All decisions on processing steps required are applied automatically to each region image of the original. The system takes into consideration the region type as well as the capabilities of the output device. The system also provides for a copy mode that transfers the copy image to output media with no intervention from the operator; a step and repeat mode to repeat the same output page x number of times for an x-up plate layout; and accurate region selection by zooming in to the nearest scan pixel. Special image processing de-screen of pre-printed originals (color and monochrome) is provided to prevent Moiré patterns. The system can also be used for transparency originals and be extended to use with an automatic document handler for book reproduction.

[0033] The user may also edit each region image, save the region image, and import an external image 108 of an external file or a previously saved region image. The system provides for various special effects, for example, color (e.g., add color, change color, spot color, and process color), add tints, add border to image, reverse a region to make positive or negative, and screened text. Easy to use image adjustments are available for enlargement and reduction,

rotation, image negation and mirroring, and adjustment of photos for brightness, contrast, warmer or cooler color cast and level of color saturation. A special adaptive thresholding algorithm is provided for text and monochrome copy dot with on screen preview that allows the operator to control small features on light and dark backgrounds. Changes to each region image can be previewed on a computer monitor in a "what you see is what you get" fashion prior to output.

[0034] The system then generates an output representation, such as a digital image,110 to reassemble the region images into a new job image, and sends the job to the output device selected by the user. The file output may be in various industry standard formats like PostScript, PDF, HTML, or Windows metafiles and thus compatible with the majority of output devices. The system maintains a database of output devices and provides the user with a list to select the output device. Each output device in the database has an optimal resolution, a maximum width and height and a set of capabilities, such as CMYK separations and duplexing. The scanned image from a single scan, including the various region images, may be also sent directly to a drive or directory to save for future use. Jobs are sent to a raster image processor ("RIP") 112 in the same configuration as desktop publishing jobs. This enables RIP tools such as roam (i.e., preview of job) and rerun from completed scanned jobs.

[0035] The ODW enables a user to send a scanned image of a reflective copy to be sent directly to the output engine or preview a scanned imaged and make adjustments to selected regions before sending it to the output. FIG. 3 is an exemplary embodiment of an ODW job setting screen interface 200. The job screen interface 200 facilitates access to the type of job a user wants to create. The user selects the type of press sheet template 202, which may include a letter or other type of scanned in document such as a business card, landscape sheet, tabloid,

etc. The user must also select the type of print channel 204 of the destination of the job. The user may also specify a job name 206 for the job and select output attributes 208 and magnification percent 210 for the job. Output attributes 208 include selecting a negative or mirror image of the copy. Magnification 210 includes increasing or decreasing the copy size.

[0036] Upon completing the job settings selection, a page screen interface 250 as shown in FIG. 4 prompts the user to place a reflective copy face down on the glass of the scanner and to adjust the area of the scan. The scan area 252 defaults to the template's page size, but the size can be adjusted by defining the scan area region. In the exemplary embodiment, the top, bottom, left or right corners may be adjusted by individually moving the black bars at the four corners by a click and drag method with the computer mouse. The user then must select a scan mode 254 to give an accurate region selection and preview. In the exemplary embodiment, a monochorome mode 256 is selected for all black and white or spot color work, and a color mode 258 is selected for when the original contains any color photograph or color halftones that may need to be reproduced. The monochrome mode may be selected even if the original has color but is not being reproduced. This includes text, line art, photos, screened photos or text mixed with screens. Once the scan area 252 and scan mode 254 are adjusted, the user selects one of the scan functions 260, which includes view scan 262, scan to plate 264, or import scan 266. The view scan 262 option enables the user to designate regions from the scanned image and make adjustments to the regions, before transferring the job to the print channel. If the scan to plate 264 option is selected, a single full-page size region is transferred to the print channel and no further action is required. The import scan 266 option allows for a previously saved scanned image to be imported into the present job.

[0037] FIG. 5 is an exemplary embodiment of an ODW scanned page view interface 300 that displays the scan image if the view scan 262 or import scan 266 is chosen by the user. The user defines at least one region on the displayed scanned image 302 before the job is sent to the output. A region can be the entire scanned image or a particular section of the scanned image. To define a region, the user selects the new region button 304, designates a region, and then chooses a region type 306 that specifies the region. A list of regions 308 appears in the upper right-hand window 310 of the scanned page view 300. In the exemplary embodiment, the region type 306 may include text_line art 312, photo 314, screened 316, blanking 318, external text_line art 320, and external photo 322. The region type 306 depends on the type of copy being scanned. Text_line art 312 is used for typed text, line art drawings, text mixed with screens, or coarse screen photos. Photo 314 is used for photographs. Screened 316 is used for halftones. Blanking 318 is used for background or areas that a user would like to erase. External text_line art 320 is used to add previously digitized text, line art, or screens. External photo 322 is used to add previously digitized photos.

[0038] All decisions on processing are automatically applied to each region by the system. In the exemplary embodiment, the final output is rasterized into 1 bit data and the system applies the following image processing steps depending on color and region type. Monochrome photos include processing of gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot. Monochrome photos are presented to the RIP as grayscale tiff in scan resolution along with placement and sizing instructions. The RIP rasterizes grayscale tiffs by halftones. Monochrome screens include processing on descreen (i.e., blur), gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot.

Monochrome screens are presented to the RIP as grayscale digital image in scan resolution along with placement and sizing instructions. Color photos include processing on gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot. Color photos are presented to the RIP as RGB digital image in scan resolution along with placement and sizing instructions. The RIP separates RGB digital images into CMYK and rasterizes each separation by halftoning. Color screens include processing on descreen, gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot. Color screens are presented to the RIP as RGB digital image at scan resolution along with placement and sizing instructions. The RIP separates RGB digital images into CMYK and rasterizes each separation by halftoning. All text and line art include sharpness, resizing and expansion to output device resolution, and threshold. Text regions are presented to the RIP as 1 bitt (rasterized) digital images in final device resolution along with placement and color instructions. The RIP does not process the image any further but only applies placement and output color rules.

[0039] FIG. 6 illustrates how multiple regions are selected on a scanned image 350, which is a page that has two-columns of text 352 and contains a drawing 354 at the top of the second column. First, the user defines the entire area of the scanned image as a first region 356 by selecting the whole page and designating a region type 306 for the first region. Then, the user defines the drawing separately as a second region 358 by selecting only the drawing 306. After selecting a region, zoom controls 360 (FIG. 5) may be used to adjust the region either by using the zoom tools 362, 364 to enlarge or reduce the image around the click point and the fit button 366 to size the region to the window.

[0040] Adjustments can also be made to each designated region by selecting the options button 366 (FIG.5) on the scanned page view interface 300. Options may include adjusting color, scan threshold, borders, background and photo or reversing to show a negative or positive of the designated region. FIG. 7 is an exemplary embodiment of an ODW color tab screen interface 400. On the color tab screen interface 400, the user can choose the foreground color for the designated region with a spot color 402, a process color 404, a capture color 406, or auto color 408. A color library may be accessed by selecting any color square 410 on the color tab screen interface 400. FIG. 8 is an exemplary embodiment of an ODW color library screen interface 420. A color name 422 or definition 424 may be changed and colors may be added or edited. Spot color 402 (FIG. 7) enables selection of a spot color. A spot color is printed using a dedicated separation (printing plate) and ink color. Use of spot color guarantees correct color matching if the correct color ink is used on the press and enables fine detail reproduction. Process color 404 (FIG. 7) enables selection of a process color. A process color is produced by a subtractive combination of primary inks, typically cyan, magenta, yellow and black, on printed material or by an additive combination of primary illuminants, typically red, green, and blue, on video displays. Process color can be used to represent a large range of hues with just a few primary colorants. Capture color 406 (FIG. 7) enables selection of a process color from an eye dropper control on the full scan page, saved previously. The process color is selected by picking a point within an image and measuring the image color at that point. Color capture provides a printed color that correctly matches the color of the selected point in an image. Auto color 408 (FIG. 7) results in a black output for text and the scanned color for the remaining areas.

[0041] FIG. 9 is an exemplary embodiment of an ODW scan threshold tab screen interface 426. The threshold tab screen interface 426 is equivalent to an exposure selection for a bilevel image. Controls on the scan threshold tab interface 426 include threshold 428, highlight 430, shadows 432, and fine tints 434. To use the controls, a user enables a preview 436 of the copy and adjusts the zoom controls 438. Threshold 428 is used to lighten or darken a line or area. The highlight 430 is used to control small features on a light background. Shadows 432 is used to emphasize or remove small white features on a dark background. Fine tints 434 is selected to image very small dots.

[0042] FIG. 10 is an exemplary embodiment of an ODW borders tab screen interface 440. The borders tab screen interface 440 places a border around the selected region and designates a color for the border. Controls on the scan borders tab screen interface include border thickness 441 and border color 444. To use the controls, a user enables a preview 436 of the copy and adjusts the zoom controls 438. Boarder thickness 441 is used to select the desired thickness of the border line. Border color 442 is used to select the color of the border line, which may include a border spot color 443, border process color 444, border captured color 445, or border auto color 446. The border auto color results in a black border. FIG. 11 is an exemplary embodiment of an ODW background tab screen interface 448. On the background tab screen interface 448, the user can choose the background color for the selected region. Colors include a background spot color 4, a background process color 452, a background capture color 454, or background auto color 456. The background auto color results in a white background.

[0043] FIG. 12 is an exemplary embodiment of an ODW photo adjust tab screen interface 460. On the photo adjust tab screen interface 460, the user can make adjustments to the photo

including brightness 462, contrast 464, warmer/cooler 466, and saturation 468 of the selected region. Brightness 462 is used to adjust the photo's overall brightness. Contrast 464 is used to adjust for light or dark contrast in the subject and background of the photo. Warmer/cooler 464 is used to adjust the amount of red or blue hue in the photo. Saturation is used to adjust for the amount of color saturation in the photo. FIG. 13 is an exemplary embodiment of an ODW reverse tab screen interface 470. The reverse tab screen 470 reverses the selected region to show a positive or negative image of the region.

[0044] The ODW also enables a user to send one or more scanned images directly to a drive or directory by using a scan to disk function. The scanned image can then be processed by the ODW at a later time. The scan to disk function enables the size or location of one region image on the reflective copy to be change and not the other region image or to move the region image to another computer. The scan to disk function may be used when the user wants to combine region images from more than one original reflective copy into the job or to place the same region image on several different jobs.

[0045] The scan to disk screen interface 500 as shown in FIG. 14 prompts the user to place a reflective copy face down on the glass of the scanner and to adjust the area of the scan. The scan area 502 defaults to the template's page size, but the size can be adjusted by defining the scan area region. In the exemplary embodiment, the top, bottom, left or right corners may be adjusted by individually moving the black bars at the four corners by a click and drag method with the computer mouse. The user then must select a scan mode 504 to give an accurate region selection and preview. In the exemplary embodiment, a monochrome mode 506, color mode

508, or color screens 510 is selected. Once the scan area 512 and scan mode 514 are adjusted, the user selects one the view 516 to view the scanned image.

[0046] FIG. 15 is an exemplary embodiment of an ODW scan to disk scanned page view interface 520 that displays the scanned image. The user must define at least one region on the displayed scanned image 522 before the job is saved to directory or disk. A region can be the entire scanned image or a particular section of the scanned image. To define a region, the user selects the new region button 524, designates a region, and then chooses a region type 526 that specifies the region. A list of regions 528 appears in the upper right-hand window 530 of the scanned page view 520. In the exemplary embodiment, the region type 526 may include text_line art 532, photo 534, and screened 536.

[0047] The ODW also enables a user to edit the layout of the printed press sheet including press sheet width and length, the trim sheet width, length, and the location on the press sheet, and the page dimension. Commonly used templates for jobs are already defined to correctly and accurately position pages on the output media, while multiple templates databases are available for differing output devices. Templates define the press sheet size, the trim sheet size, and the page size for a job, and also describe the details of each page, and printer's marks. Multiple pages can be placed on single output media by defining gutters and margins or can be placed on both sides of output media for capable output device. The system also provides the ability to add various printer marks, including cut marks, register marks, ink bars and the title of job.

[0048] FIG. 16 is an exemplary embodiment of an ODW template layout 550. The template layout 550 displays an example of the layout dimensions of a template in relation to the

trim sheet 552 and the press sheet 554. The user can specify how many pages will be printed on the same press sheet and whether or not there will be gutters between them. FIGS. 17 and 18 are exemplary embodiments of ODW ink bar selection on the bottom layout 570 and on the side layout 590. The ink bar selection layouts display the location of the printer marks 572, 592 when they are all enabled. The printer marks 572, 592 include cut marks 574, 594, register marks 576, 596, ink bars 578, 598, and title of the job 580, 600. Cut marks are placed at the corners of each page. The cut mark size and the cut mark spacing form the corner of the page is determined by the preference setting. Register marks are placed at the corners of the press sheet. If the trim sheet is not smaller than the press sheet, the register marks are not printed. When register marks are enabled, the separation (plate) color is also printed. Ink bars are placed on the bottom or side of the press sheet, depending on the selection. The title of the job including the name and date are placed on the top of the press sheet.

[0049] Generally, the printer marks, except cut marks, are printed on the press sheet and outside the trim sheet. They are obscured by any other information. If printer marks are desired, then the margin is adjusted for all four sides of the trim sheet. FIG. 19 is an exemplary embodiment of an ODW cut mark layout 610 where there are no gutters and cut marks 612 are outside of the pages edges 614. Cut marks are only necessary for multiple page jobs, other marks are only necessary for two or more color jobs. If a template page size magnification is adjusted, the page size will be different from the original reflective copy by the amount of magnification. If the template page rotation is adjusted, then the template width is the same as the copy length, and the template page length is the same as the copy width.

[0050] FIG. 20 is an exemplary embodiment of an ODW template management screen interface 650. On the template management screen interface 650, the existing templates may be edited or deleted, new templates may be created, templates may be copies. The template management also displays a set of parameter screens for page size, page details, trim sheet, press sheet, and printer marks. FIG. 21 is an exemplary embodiment of an ODW template management page size screen interface.

[0051] The ODW enables a user to also access other utility functions from the system utilities screen interface 700 as displayed in FIG. 22. The system utilities screen interface includes utility options of preferences 702, file management 704, colors 706, about 708, factory settings 710, and image editor 712. Preferences 702 are setting that the user may select as defaults for the system. Parameters that are set as system defaults usually have a general application for most scanning types. File management 704 displays an image directory, which lists the file names of all scanned images and regional images. An external directory may also be viewed. Files can be renamed, deleted or exported to another directory from the image directory. Colors 706 enable the creation of a new color, the deletion of a color, or the editing of the CMYK color components in the color library. About 708 verifies the version of the system. Factory settings 710 restores factory settings for templates. Image editor 712 enables a scanned image file to be loaded and adjustments be made to it. Adjustments include cropping the image, adjusting the brightness and contrast, rotating the image, and saving the image with another file name.

[0052] The image is sent to the raster image processor 112. Output from the raster image

processor is sent to a digital output engine, such as a digital plate master or digital press. The output engine can create plates, proofs, or printed sheets.

[0053] While the invention has been described with reference to a specific embodiment, various changes may be made and equivalents may be substituted for elements thereof by those skilled in the art without departing from the scope of the invention. In addition, other modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. The present invention herein is not to be construed as being limited, except insofar as indicated in the appended claims.

What is claimed is:

1. An optical to digital prepress workflow method comprising the steps of:

converting an optical image into a digital version of the image;

displaying the digital version;

selecting a region of the digital version;

designating a region type for the region;

translating the region into coordinates;

separating the region from the digital version and processing the separated region into a separate region image;

manipulating the separate region image; and

assembling the region image into an output image.

2. The method according to claim 1 further comprising the steps of:

selecting a second region of the digital version;

designating a region type for the second region;

translating the second region into coordinates;

separating the second region from the digital version and processing the separated second region into a separate second region image;

manipulating the separate second region image; and

assembling the second region image into the output image.

3. The method according to claim 2 wherein the region type for the second region is different from the region type for the first region.

4. The method according to claim 2 wherein the separated second region is manipulated separately from the separated first region.

5. The method according to claim 1, wherein the processing of the separated region includes processing of a corresponding one or more of gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot for monochrome photo; descreen, gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot for monochrome screen; gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot for color photo; descreen, gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot for color screen; sharpness, resizing and expand to output device resolution, and threshold for text and line art.

6. The method according to claim 1, wherein manipulation of the region image includes at least one of adjusting color, adjusting scan threshold, defining borders, adding background, and reversing to show a negative of region image.

7. The method according to claim 1 further comprising the step of transmitting the output image to an output engine.

8. The method according to claim 1 wherein the output engine is a digital plate master.

9. The method according to claim 1 wherein the output engine is a digital press.

10. An optical to digital prepress workflow system comprising:

a scanner and processor adapted for scanning an optical image and converting the image to a digital version of the image;

a display for displaying the digital version of the image;

an operator control for selecting a region of the digital version, wherein the processor translates the region into coordinates, separates the region from the digital version, and processes the separated region into a separate region image;

wherein the operator control and processor are adapted for manipulating the separate region image and assembling the separate region image into an output image.

11. The system according to claim 10 further comprising a connection for connecting the processor to an output engine.

12. The system according to claim 11 where in the engine is a digital plate master.

13. The system according to claim 11 where in the engine is a digital press.

14. The system according to claim 10, wherein the processor and control are adapted for selecting a second region of the digital version; designating a region type for the second region; translating the second region into coordinates; separating the second region from the digital version and processing the separated second region into a separate second region image; manipulating the separate second region image; and assembling the second region image into the output image.

15. The system according to claim 14 wherein the region type for the second region is different from the region type for the first region.

16. The system according to claim 14 wherein the separated second region is manipulated separately from the separated first region.

17. The system according to claim 10, wherein the processing of the separated region includes processing of a corresponding one or more of gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot for monochrome photo; descreen, gamma correction, sharpness, brightness and contrast, and minimizing and maximizing dot for monochrome screen; gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot for color photo; descreen, gamma correction, sharpness, color hue and saturation, adjustment, brightness and contrast, and minimizing and maximizing dot for color screen; sharpness, resizing and expand to output device resolution, and threshold for text and line art.

18. The system according to claim 10, wherein manipulation of the region image includes at least one of adjusting color, adjusting scan threshold, defining borders, adding background, and reversing to show a negative of region image.

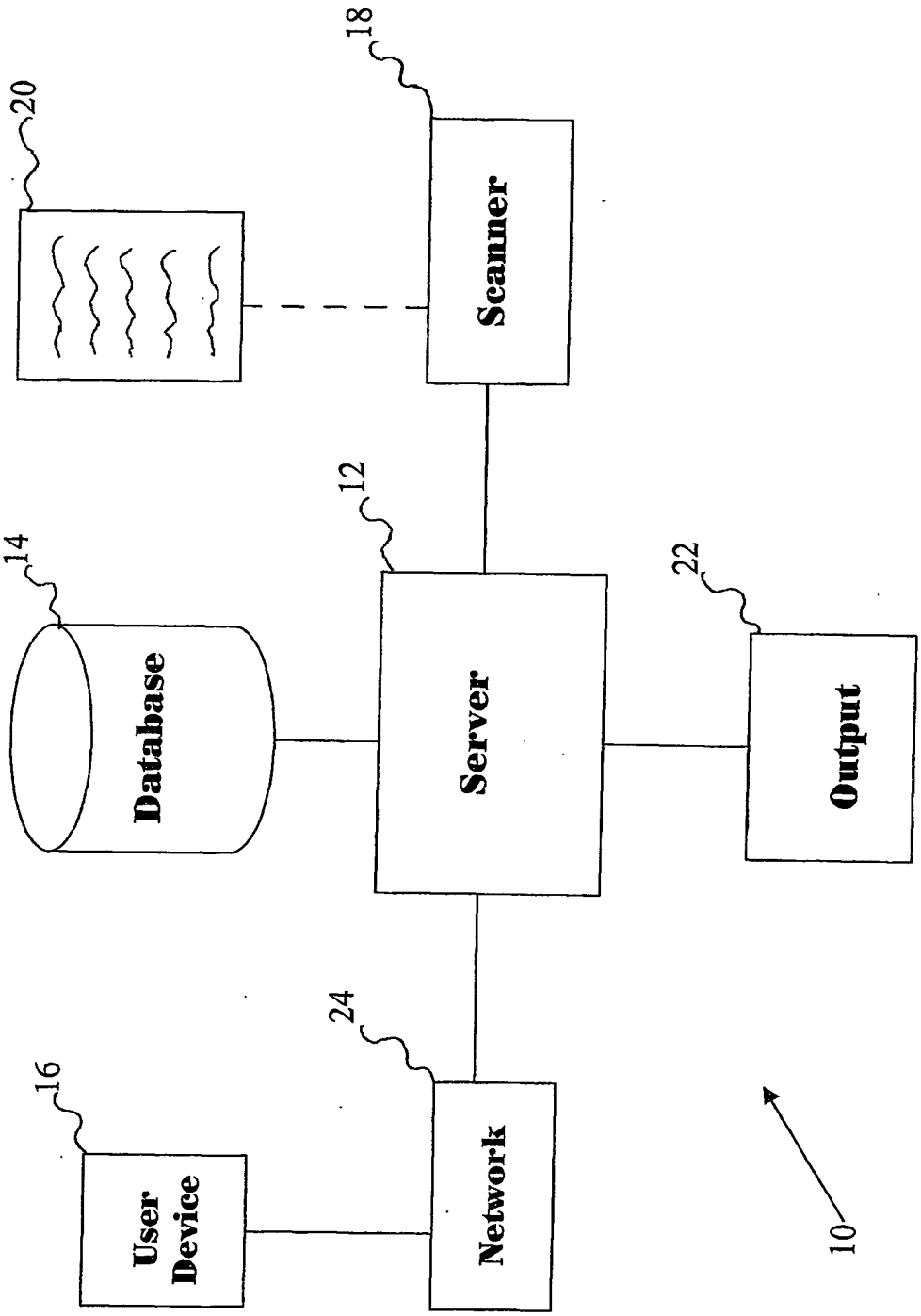
18
20
Scanner
12
14
22
Database
Server
Output
24
16
User Device
Network
10

FIG. 1

Process Flow Diagram

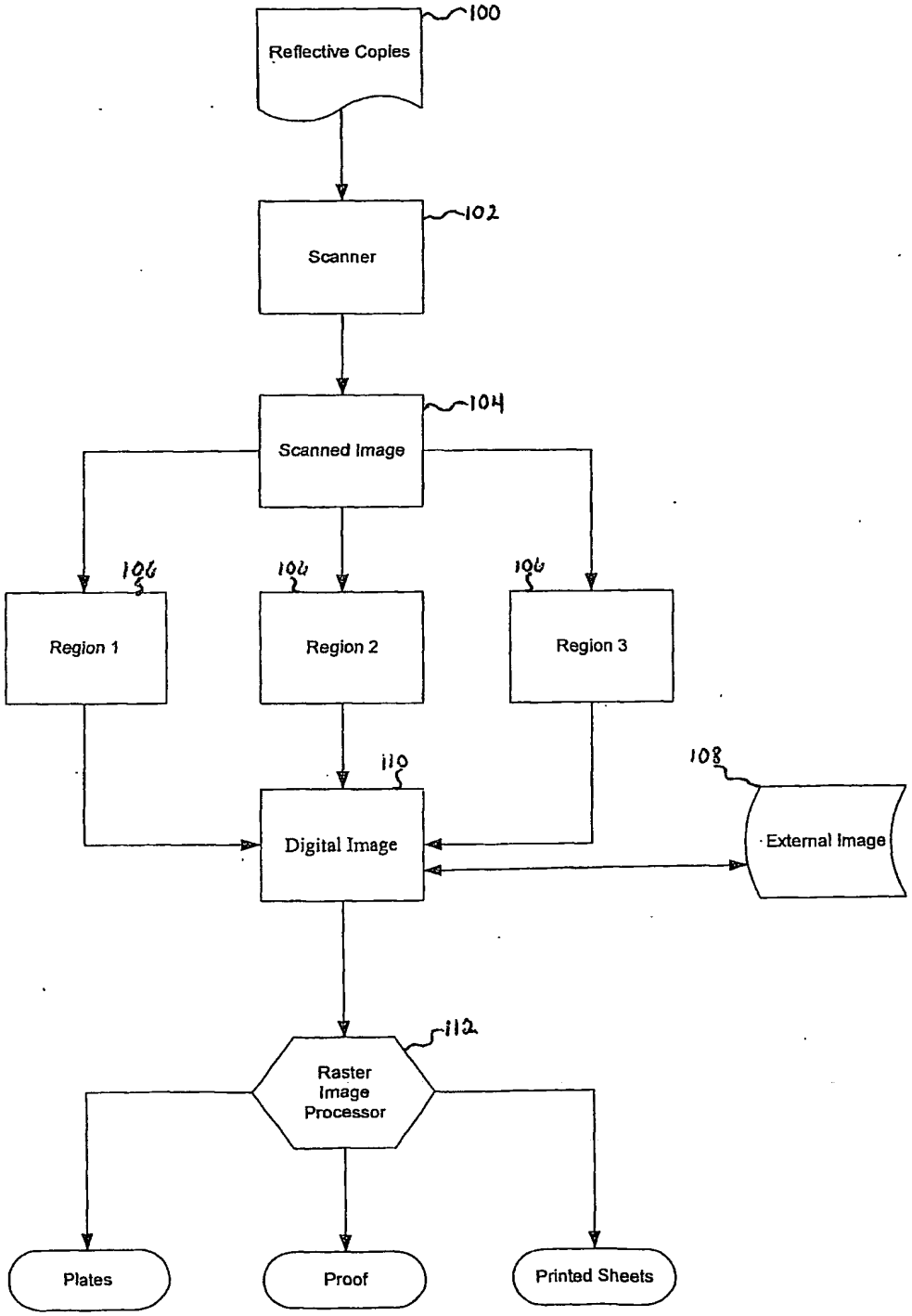

FIG. 2

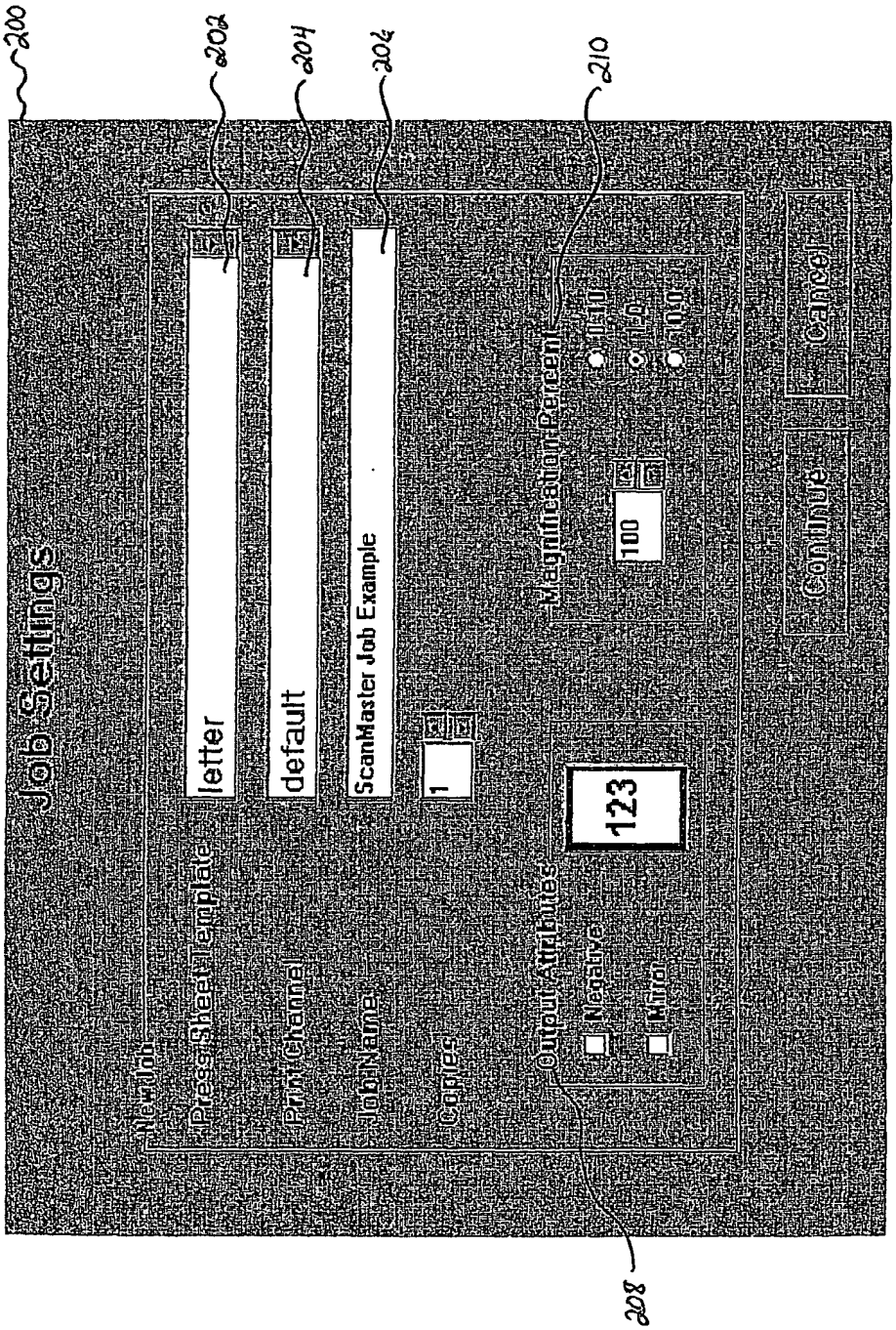
200
202
204
206
210
208
Job Settings
New Job
Press Sheet Template
letter
Print Channel
default
Job Name
ScanMaster Job Example
Copies
1
Output Attributes
Negative
Mirror
123
Magnification Percent
100
Continue
Cancel

FIG. 3

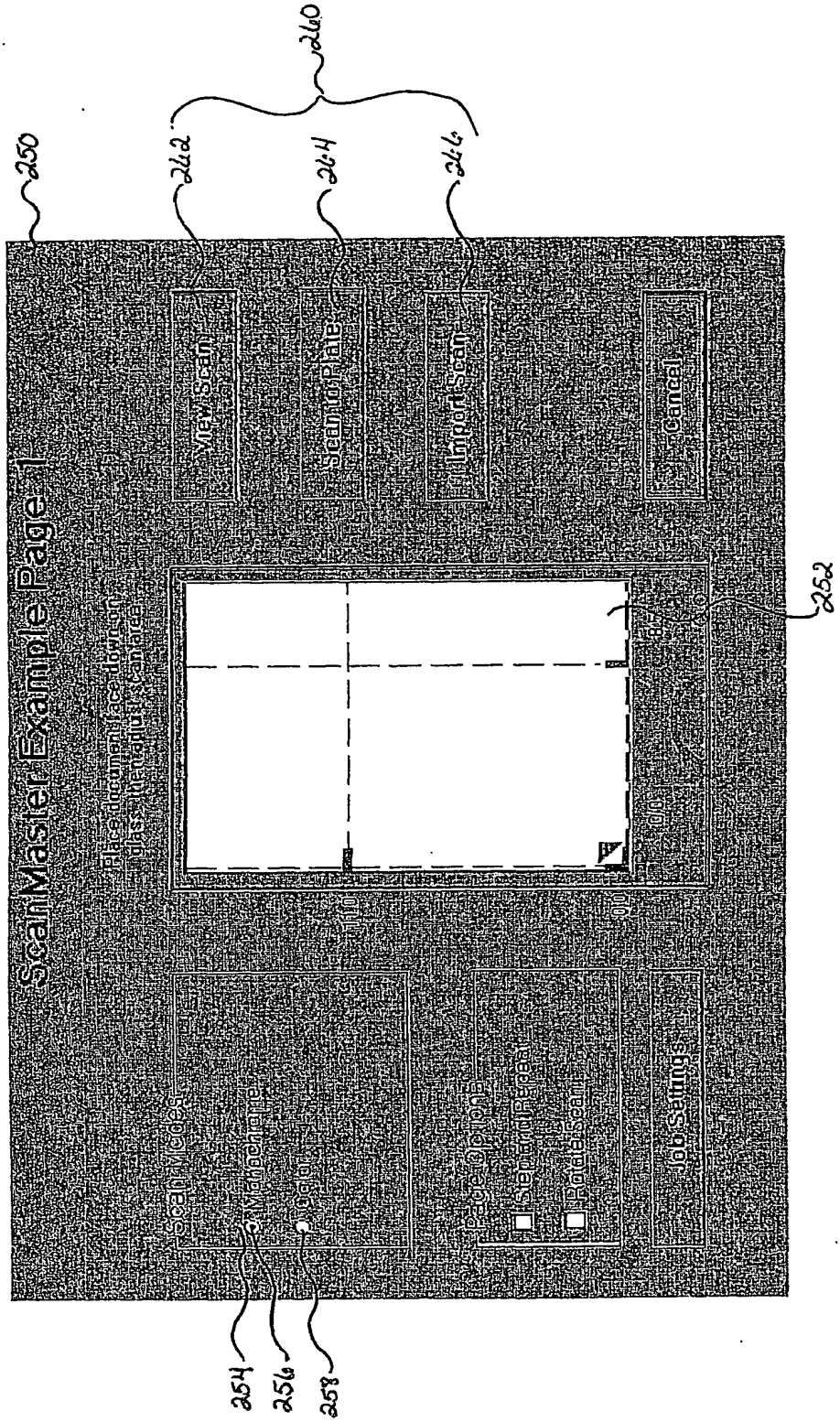
240
242
244
246
250
252
254
256
258
ScanMaster Example Page 1
Place document face down on glass. Align with arrows.
View Scan
Scan Plates
Fullpage Scan
Cancel
Scan Mode
Page Size
Standard Area
Rotate Scan
Job Settings

FIG. 4

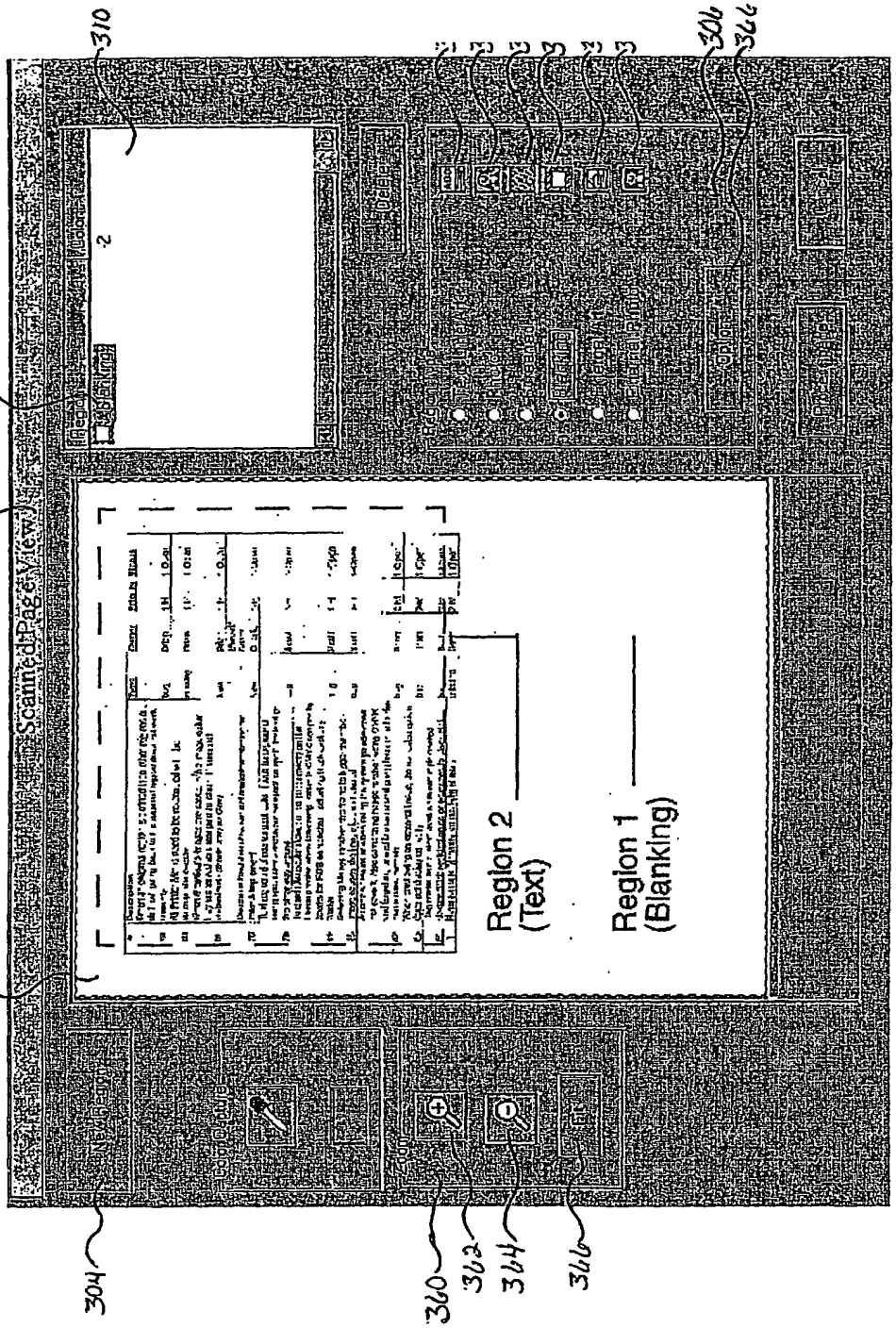
310
308
300
302
304
360
362
364
366
306
344
Scanned Page View
Region 2
(Text)
Region 1
(Blanking)

FIG. 5

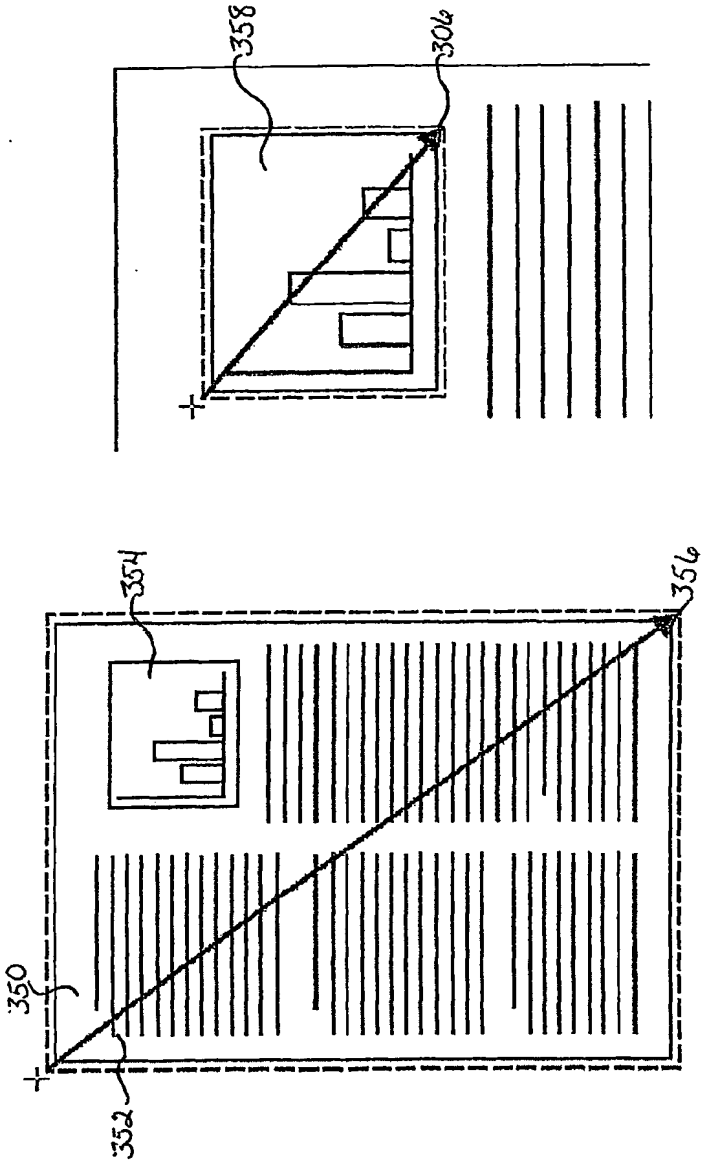

FIG. 6

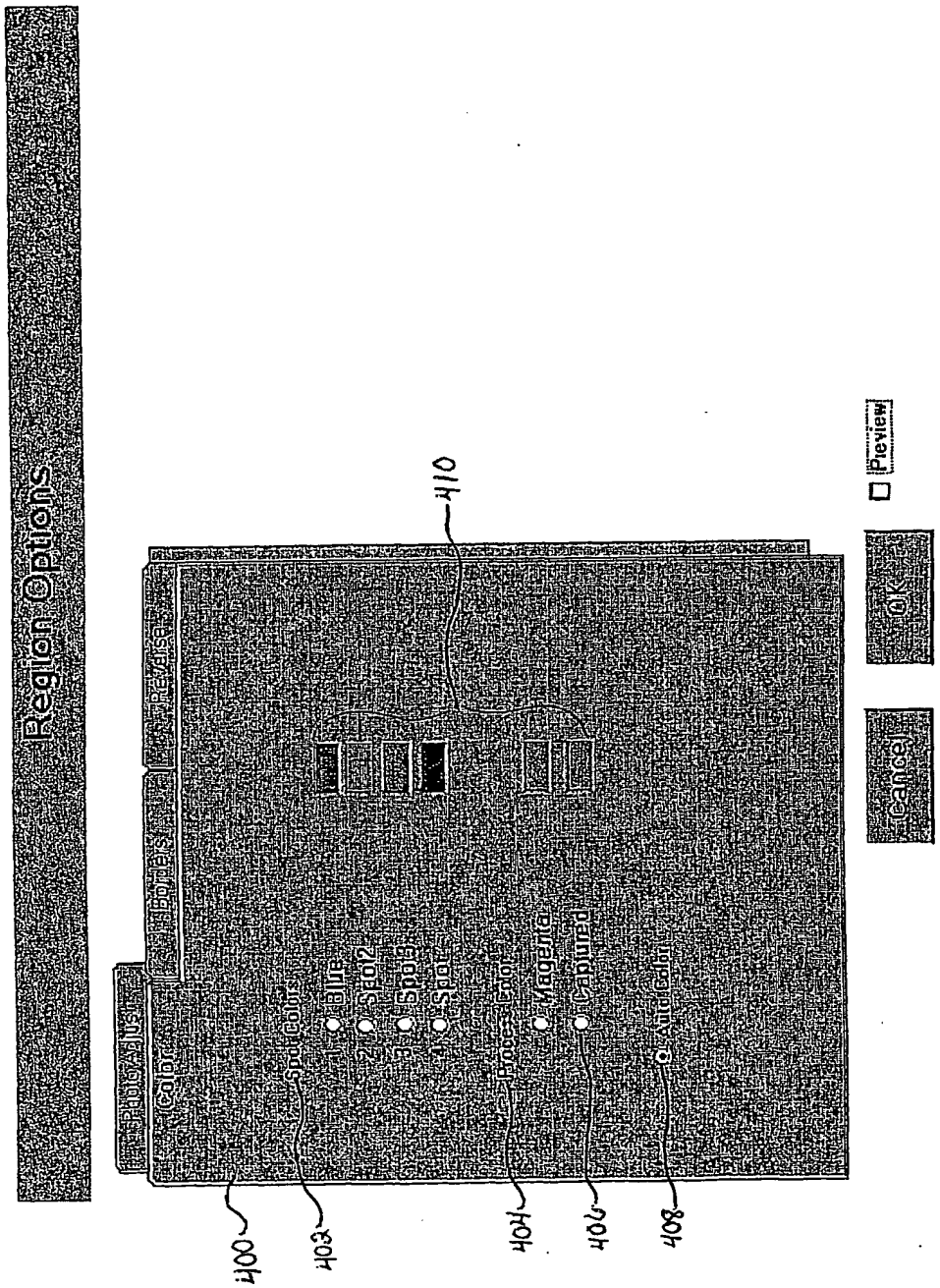
Region Options
Calibrate
Test
Reset
Spot Colors
Blue
Spot2
Spot3
Spot4
Process Color
Magenta
Cyan
Yellow
Preview
OK
Cancel
400
402
404
406
408
410

FIG. 7

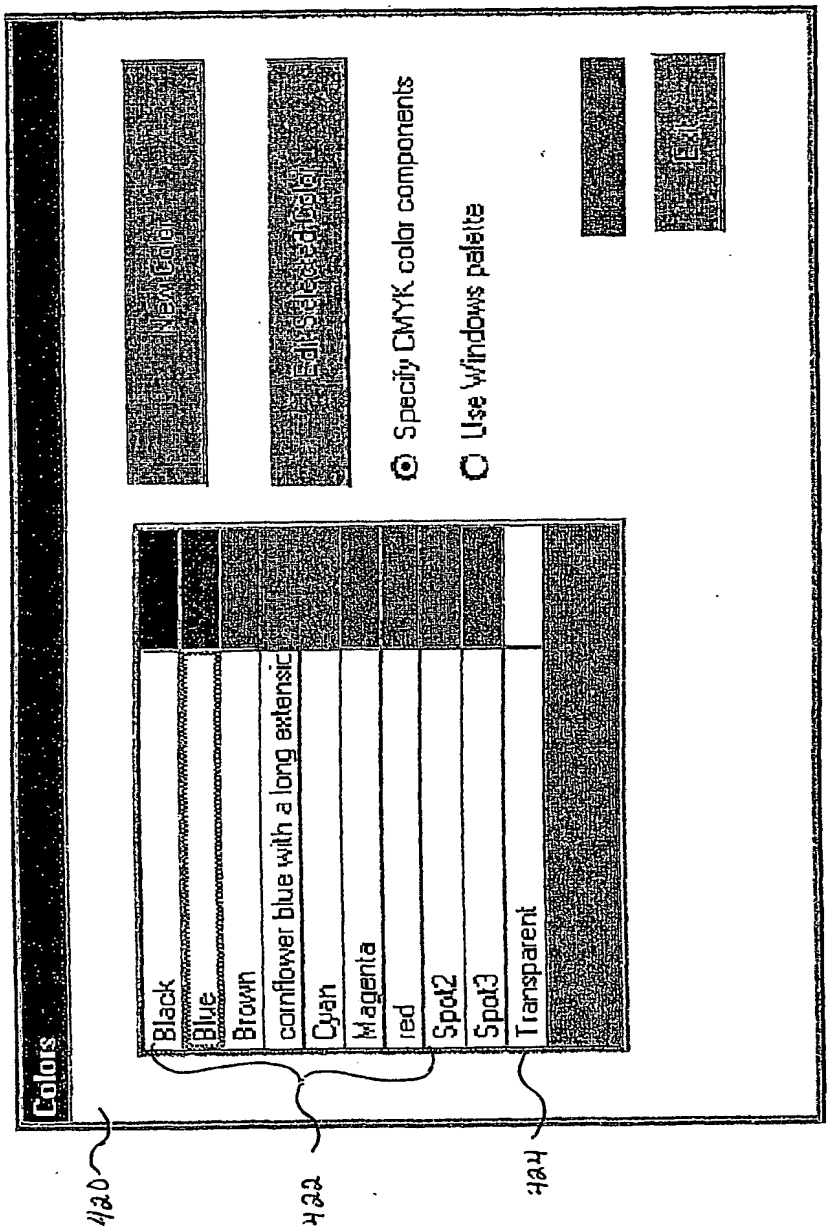
Colors
New Color...
Edit Selected Color...
Specify CMYK color components
Use Windows palette
Black
Blue
Brown
cornflower blue with a long extensic
Cyan
Magenta
red
Spot2
Spot3
Transparent
Exit
420
422
424

FIG. 8

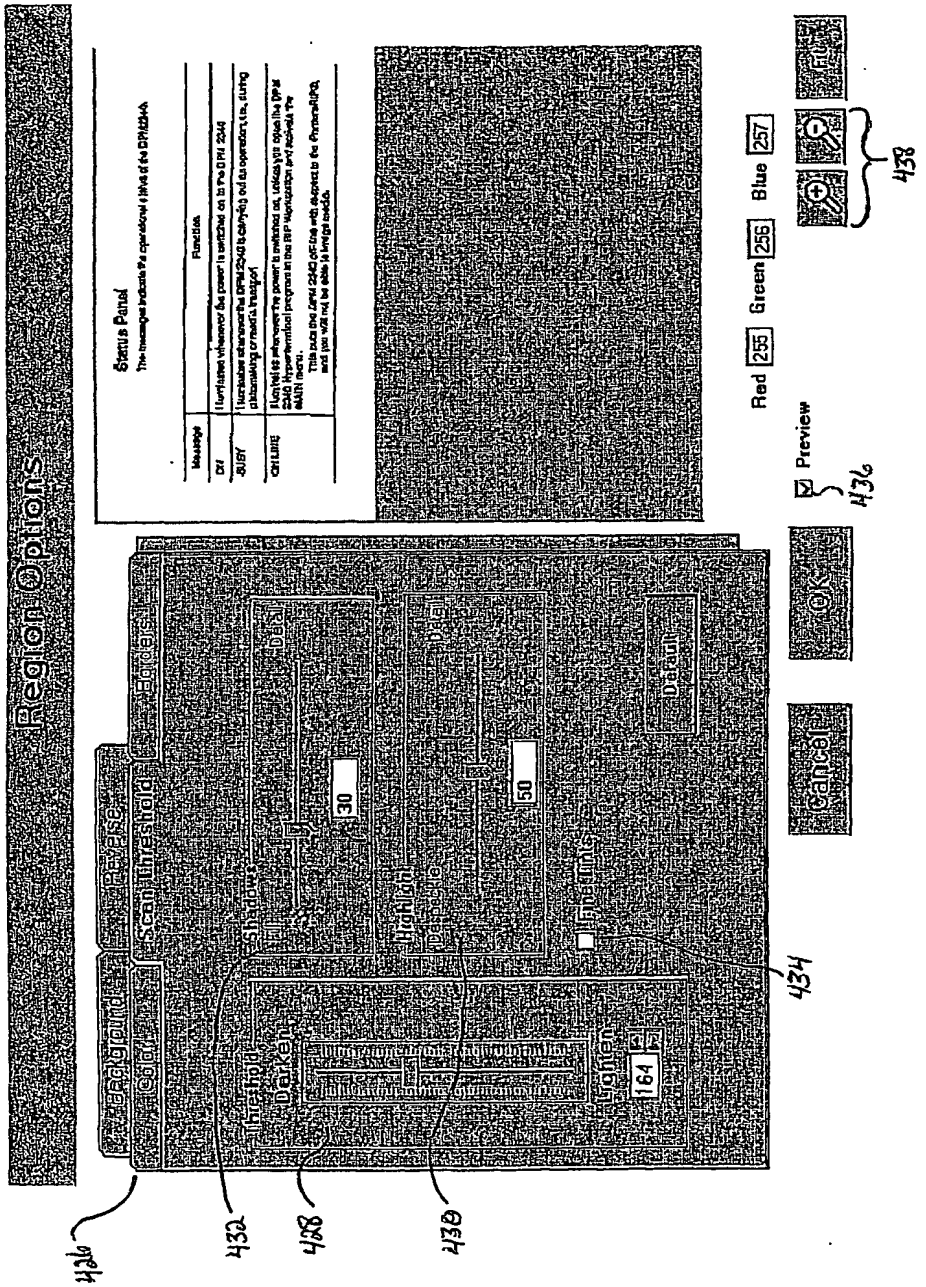
Region Options
Background
Color
Edges
Scan Threshold
Shadows
Threshold
Darken
Highlight
Lighten
Status Panel
Functions
Red 255
Green 256
Blue 257
Preview
Cancel
OK
Help
436
432
428
430
434
436
438

FIG. 9

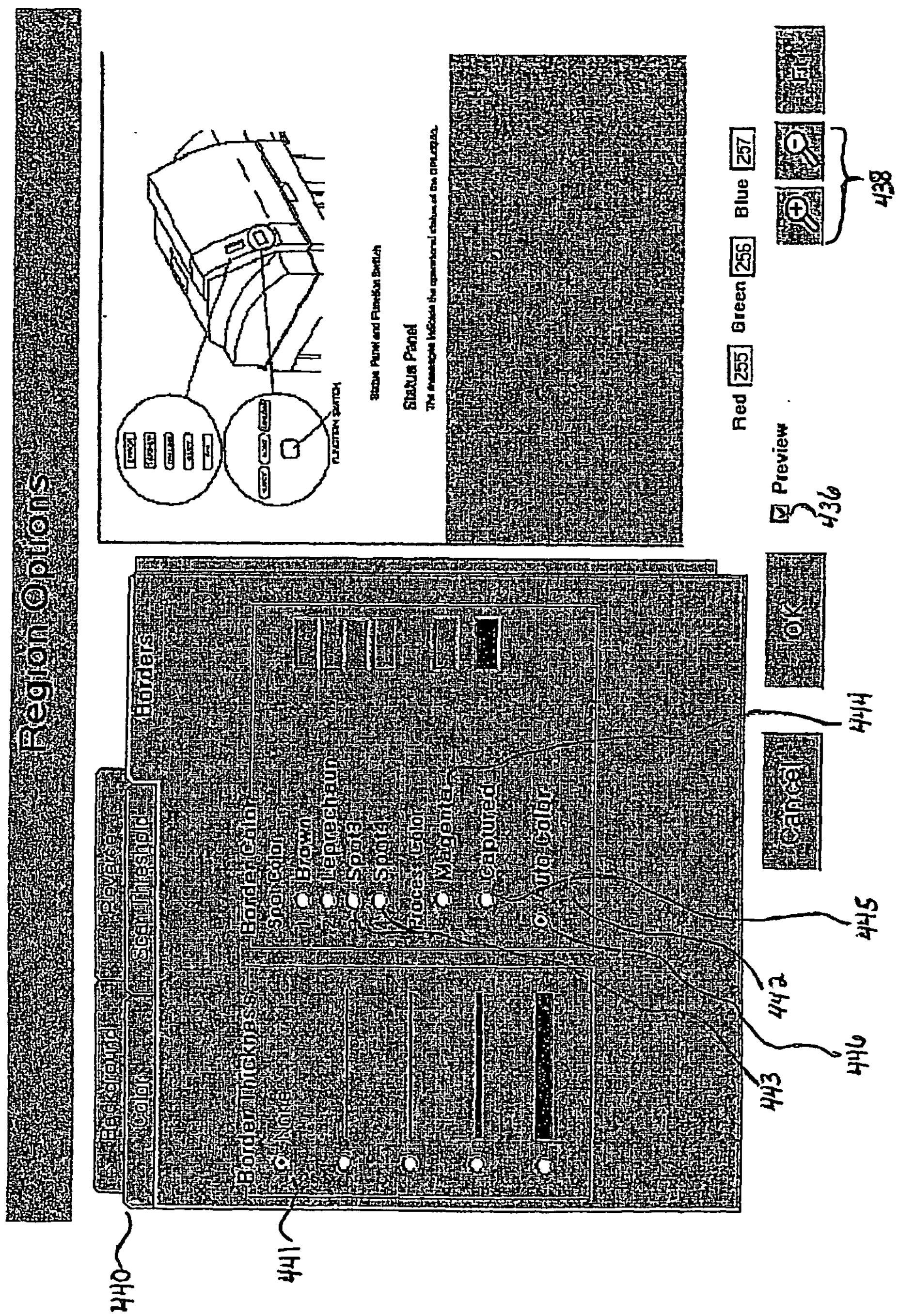
Region Options
Background
Reverse
Color
Scan Threshold
Borders
Border Thickness
None
Border Color
Spot Color
Brown
Leprechaun
Spot3
Spot4
Process Color
Magenta
Captured
Auto Color
Cancel
OK
Status Panel
Preview
Red 255
Green 256
Blue 257
440
441
443
446
442
445
444
436
438

FIG. 10

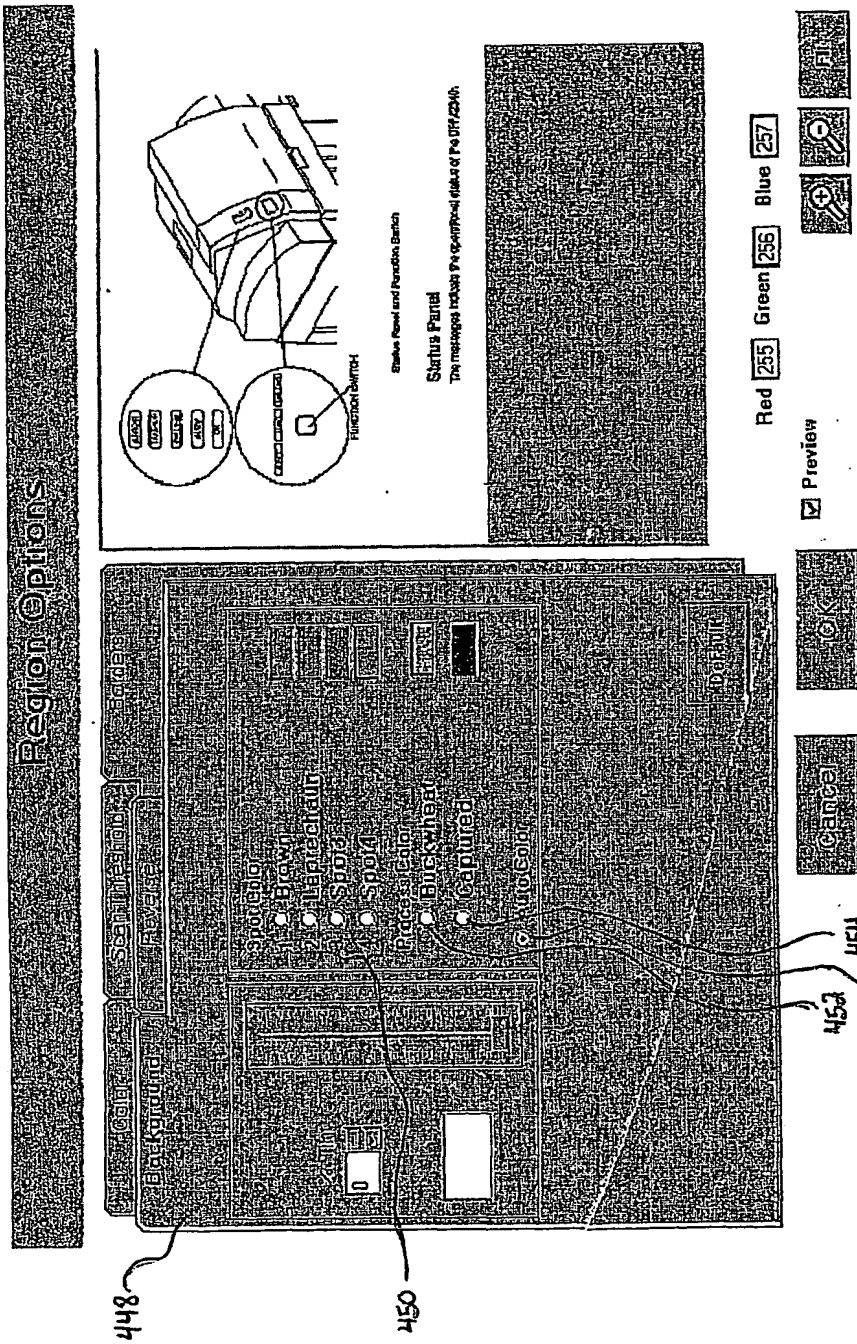
Region Options
Status Panel
Red 255
Green 256
Blue 257
Preview
OK
Cancel
448
450
452
454
456

FIG. 11

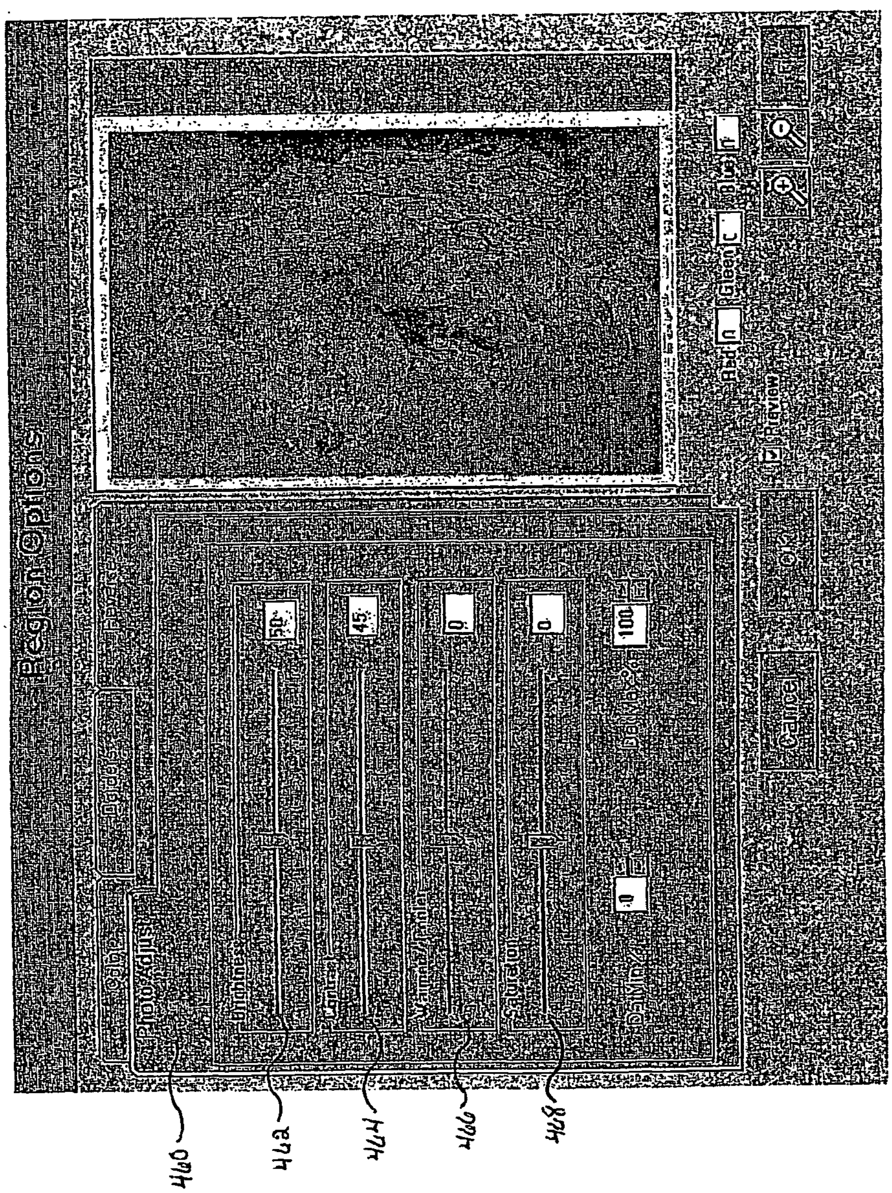

FIG. 12

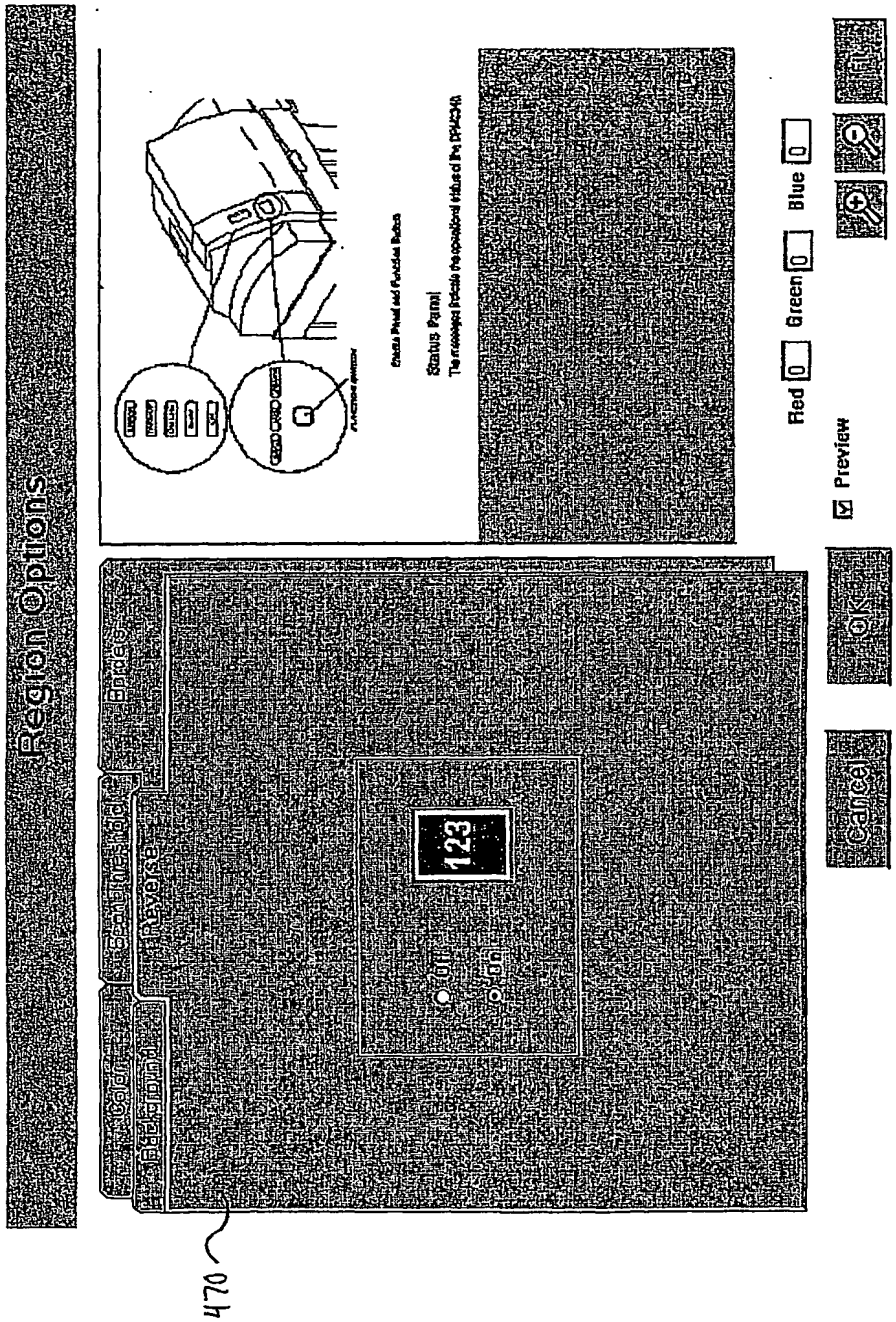
Region Options
Status Panel
Red 0
Green 0
Blue 0
Preview
OK
Cancel
123
470

FIG. 13

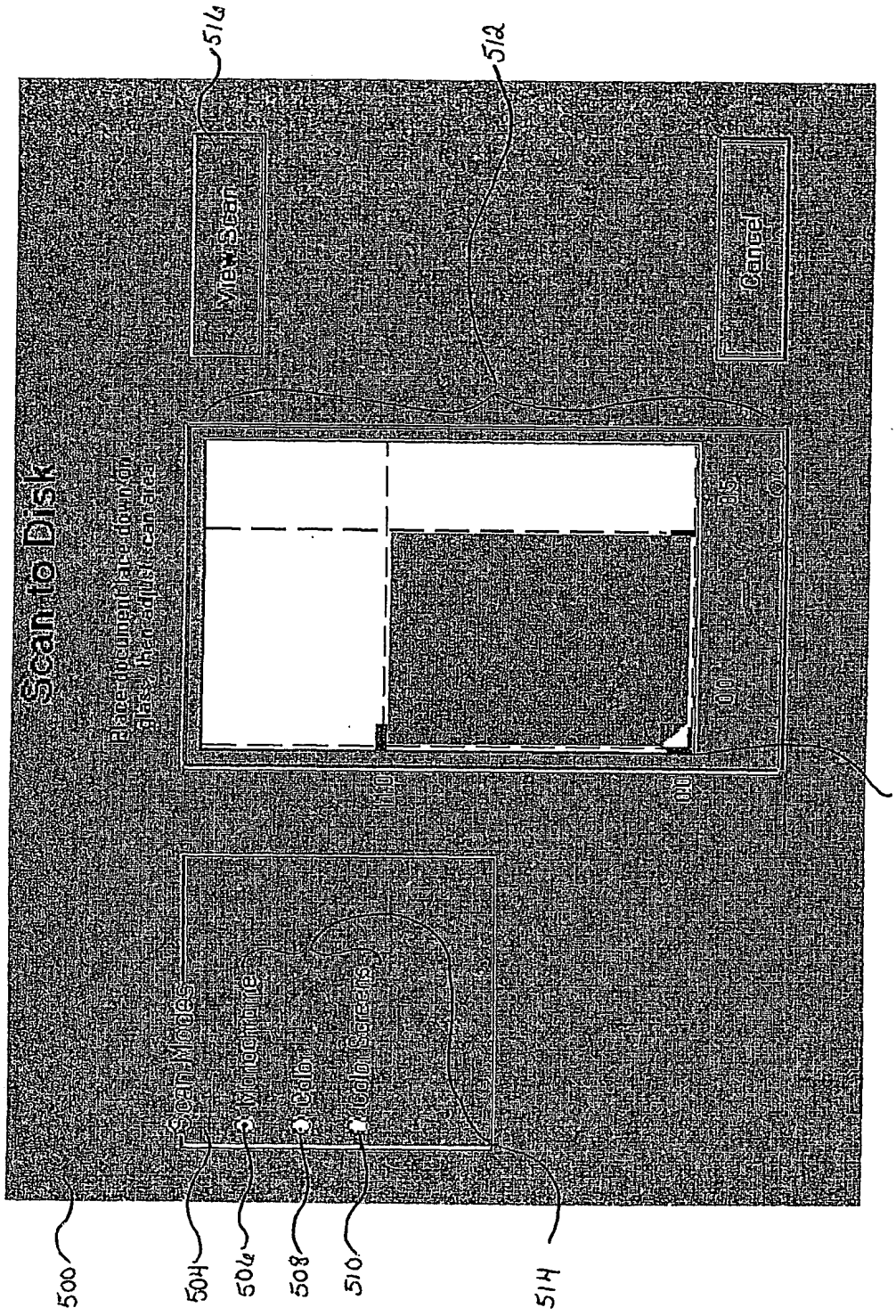
514
512
View Scan
Cancel
Scan to Disk
Scan Modes
Normal
Color
Color Enhanced
500
504
504
508
510
514
502

FIG. 14

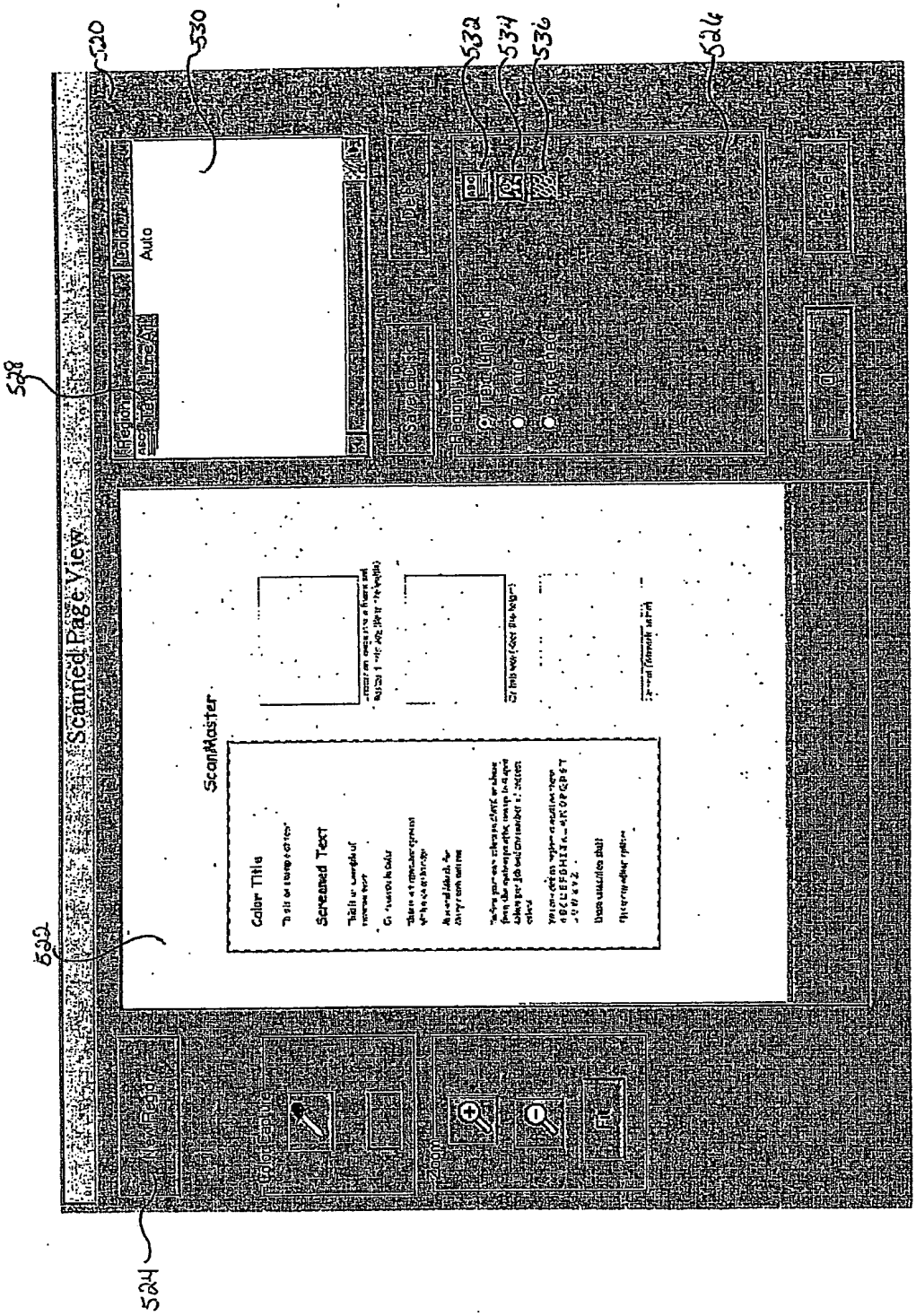
520
530
532
534
536
524
528
Scanned Page View
Auto
ScanMaster
Color Title
Screened Text
524

FIG. 15

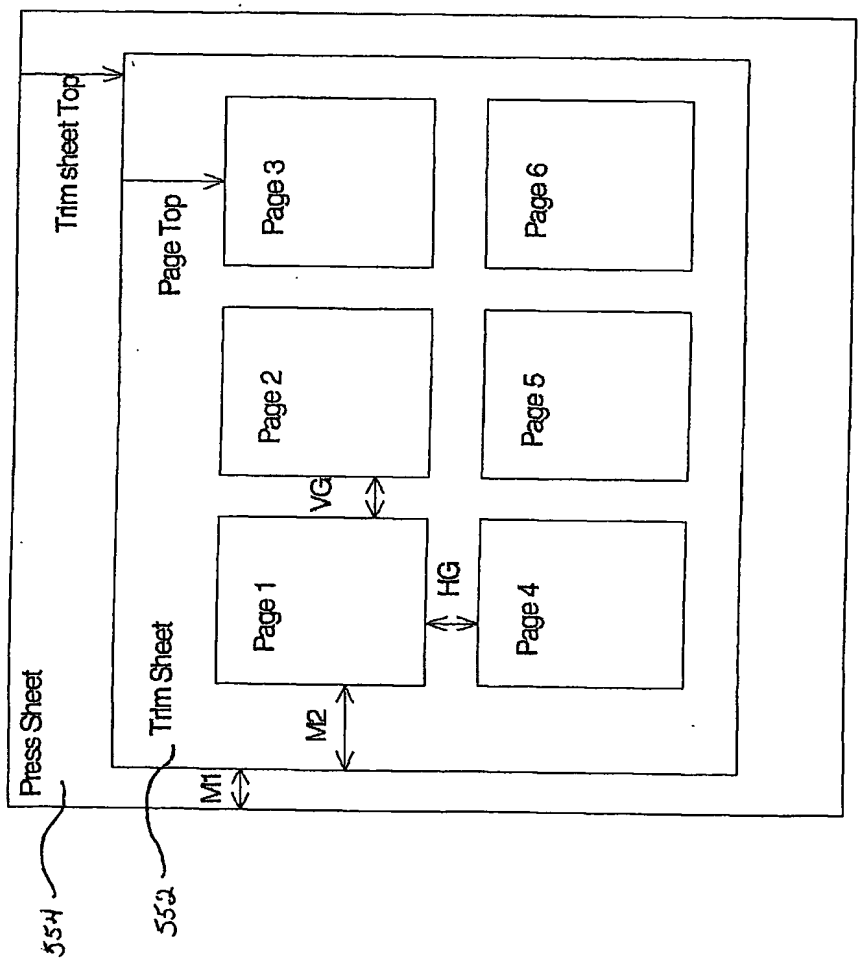
Press Sheet
Trim Sheet
Trim sheet Top
Page Top
Page 1
Page 2
Page 3
Page 4
Page 5
Page 6
VG
HG
M1
M2
554
552
550
M1 = Trim Sheet Left Margin (or select centered)
M2 = Page(s) Left margin (or select centered)
HG = Horizontal gutter
VG = vertical gutter

FIG. 16

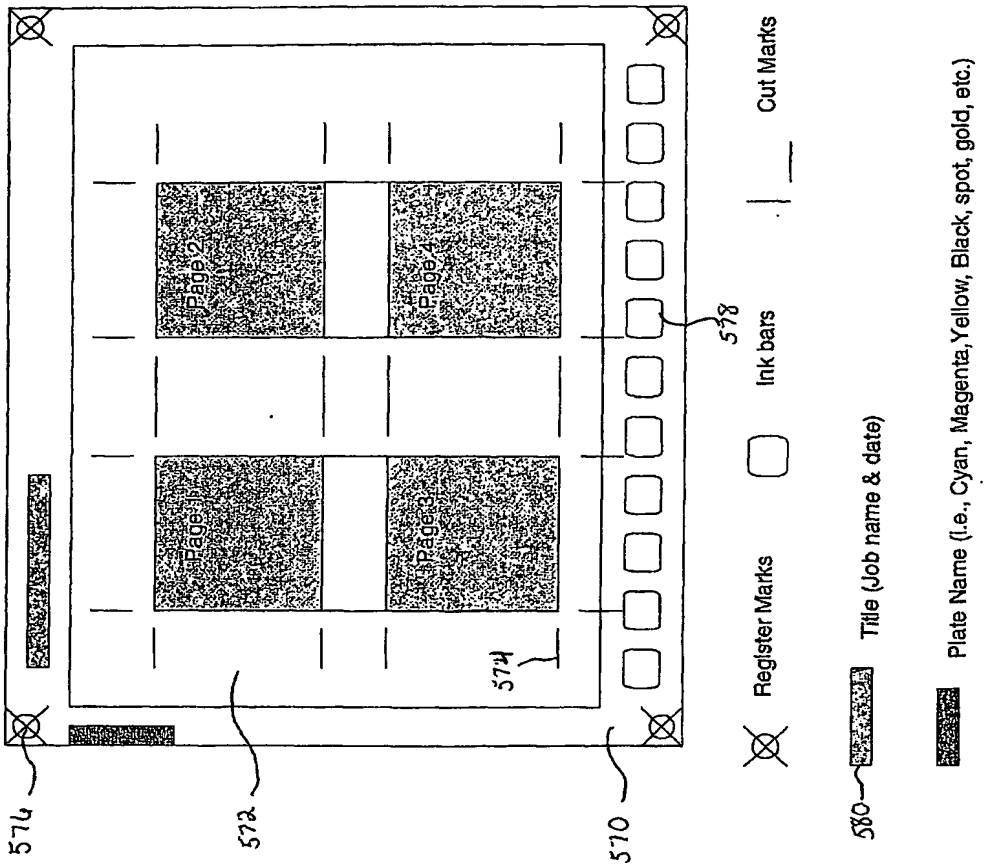
Page 2
Page 4
Page 1
Page 3
574
572
570
574
578
580
Register Marks
Ink bars
Cut Marks
Title (Job name & date)
Plate Name (i.e., Cyan, Magenta, Yellow, Black, spot, gold, etc.)

FIG. 17

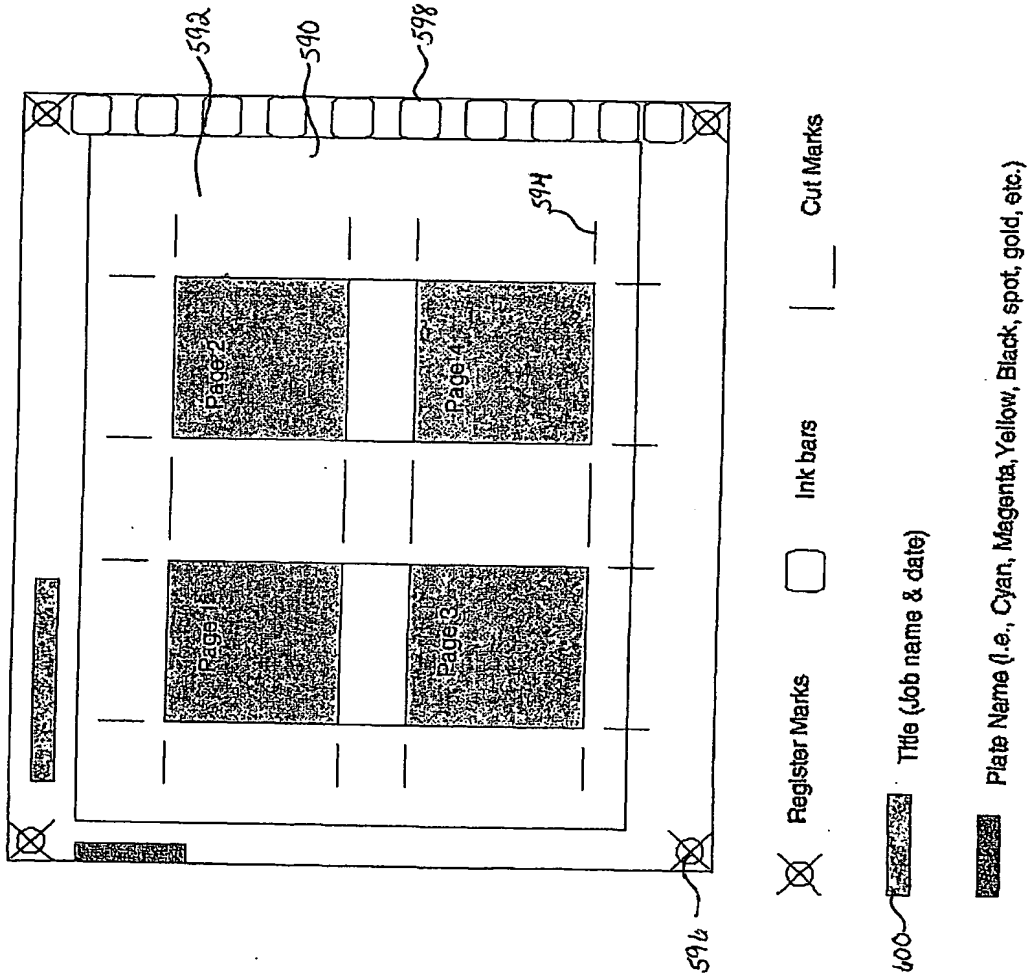
592
590
598
594
Page 2
Page 4
Page 1
Page 3
596
Register Marks
Ink bars
Cut Marks
600
Title (Job name & date)
Plate Name (i.e., Cyan, Magenta, Yellow, Black, spot, gold, etc.)

FIG. 18

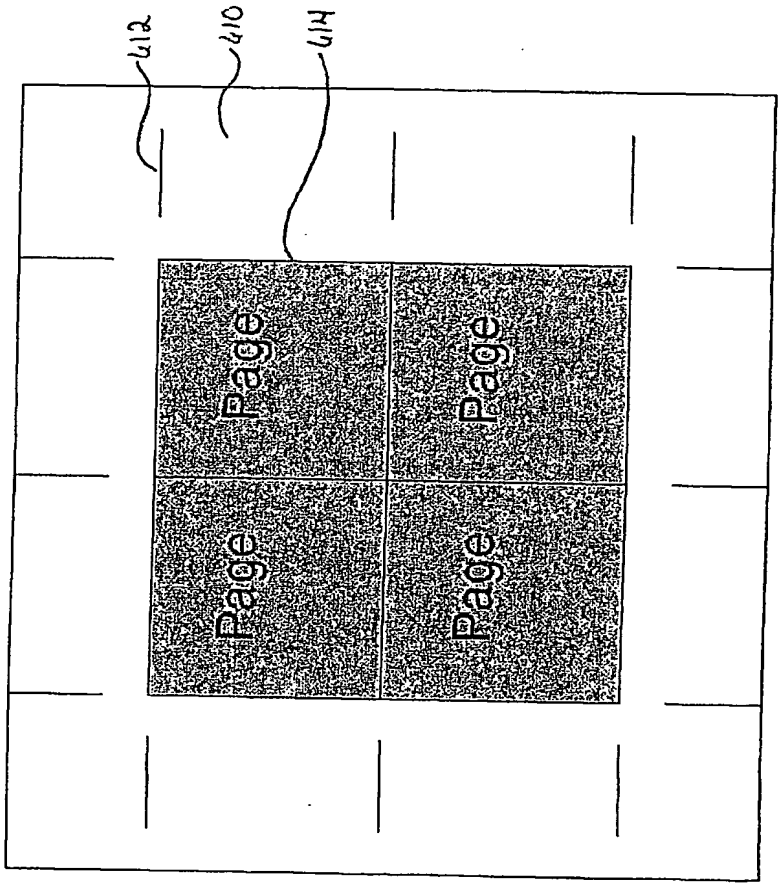

FIG. 19

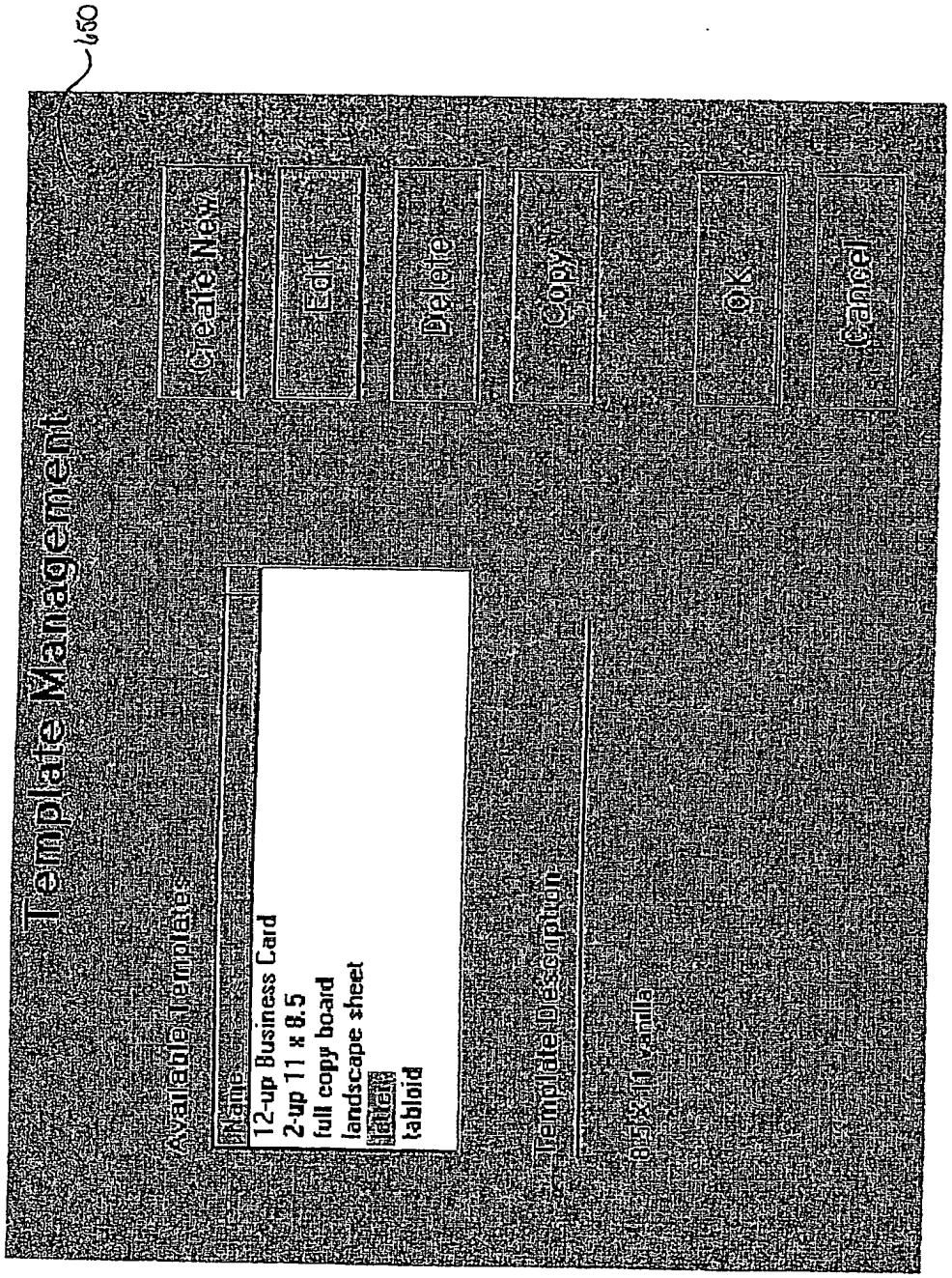
650
Template Management
Available Templates
Name
12-up Business Card
2-up 11 x 8.5
full copy board
landscape sheet
tabloid
Template Description
8.5 x 11 vanilla
Create New
Edit
Delete
Copy
OK
Cancel

FIG. 20

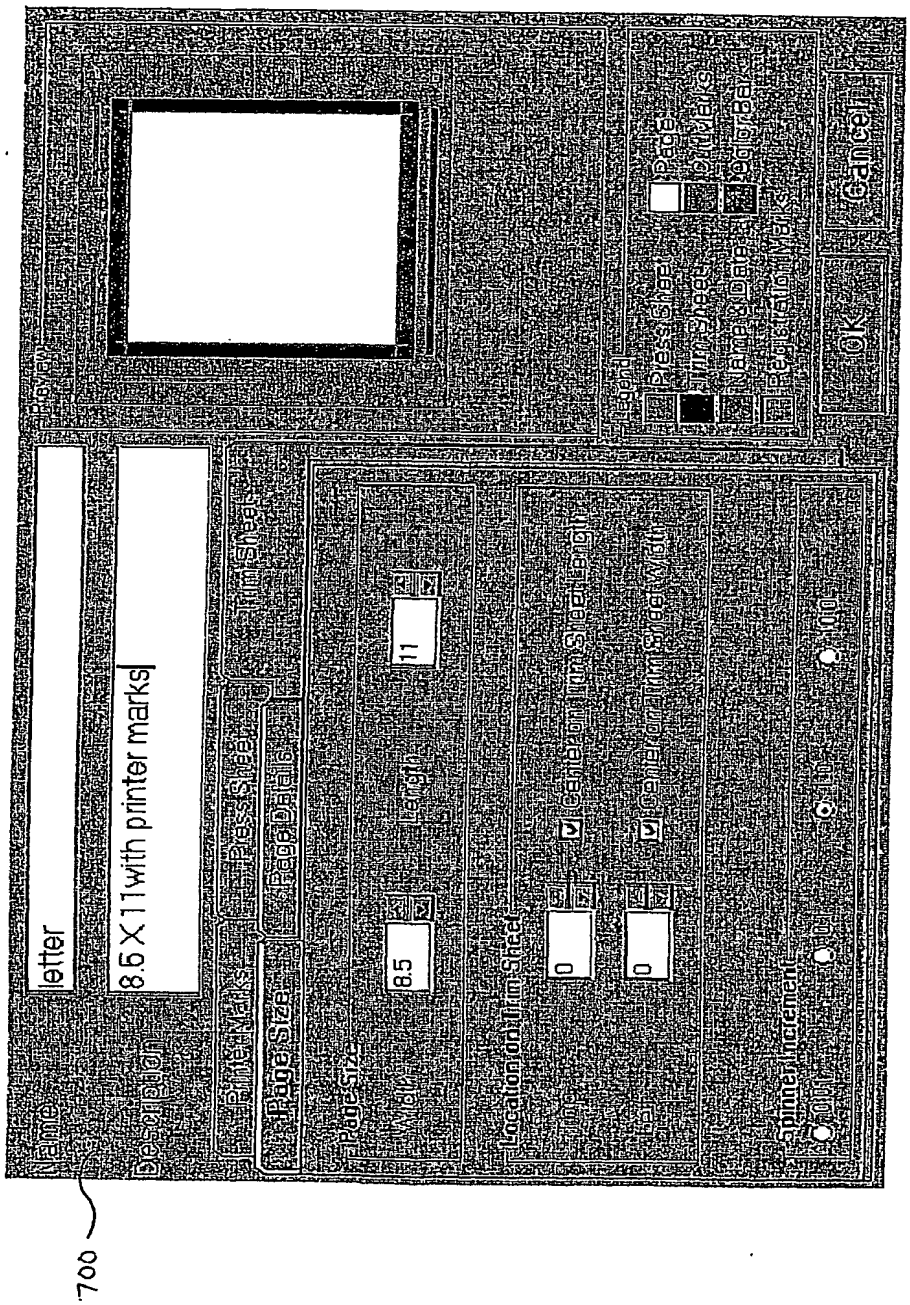
Name
letter
Description
8.5 X 11 with printer marks
Page Size
Page Details
Print Marks
Press Sheet
Trim Sheet
Page Size
Width
8.5
Length
11
Location of Trim Sheet
Embed Trim Sheet in Page
Generate Trim Sheet
0
0
Bleed
Press Sheet
Page
Bleed
Registration Marks
Name & Date
Page Info
OK
Cancel
700

FIG. 21

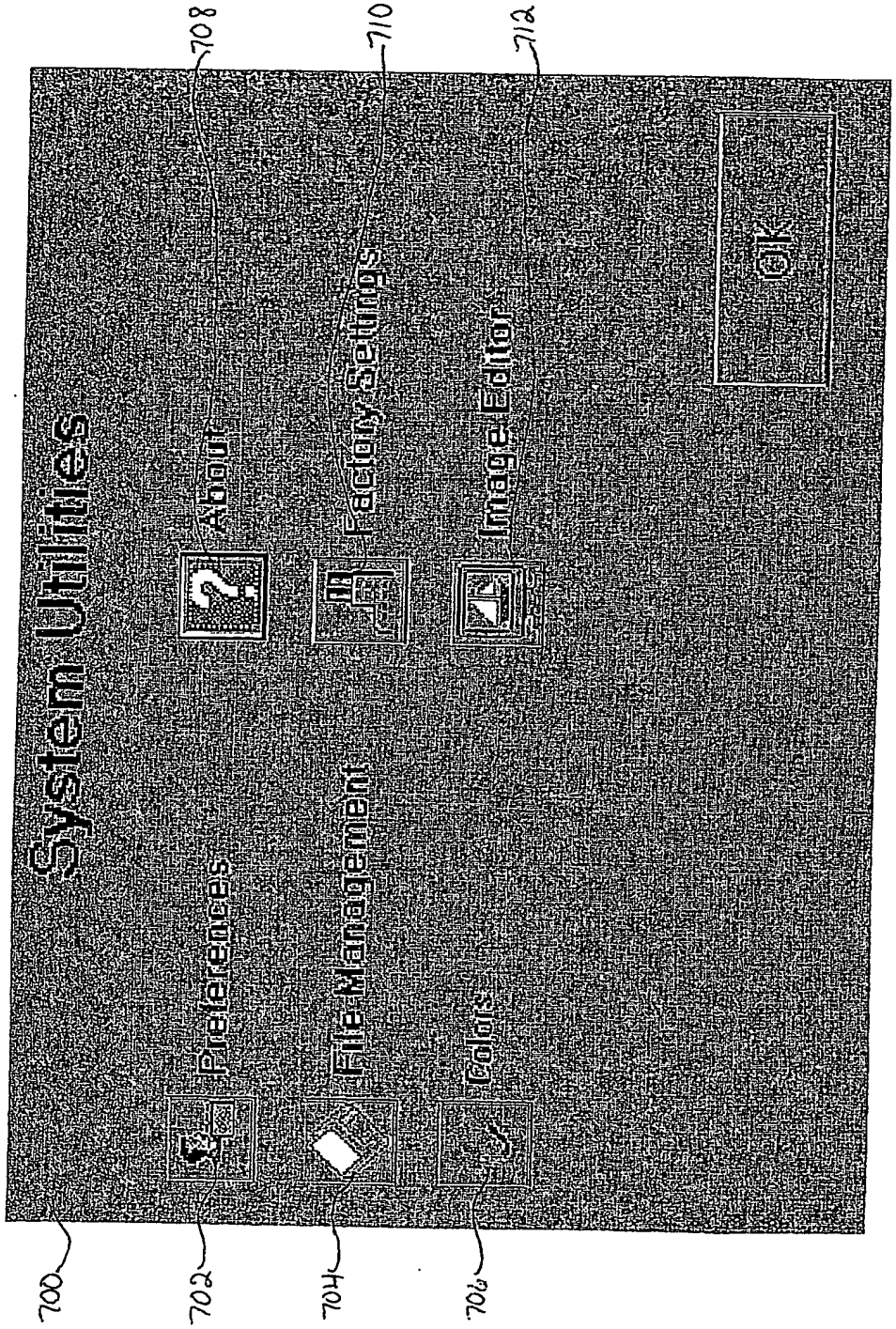
System Utilities
Preferences
File Management
Color
About
Factory Settings
Image Editor
OK
700
702
704
706
708
710
712

FIG. 22

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